Sampling Size Determination

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What is sample size determination

- Is an act of choosing the number of observations or replicates to include in statistical sample.
- Sample size is the measure of the number of individual samples used in an experiment.
- The sample size used in a study is usually determined based on the cost, time or convenience of collecting data and the need for it to offer sufficient statistical power.
- For example in a stratified survey there would be different sizes for each stratum like in a census data is sought for the entire population hence the size is equal to population.

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Factors that determine sample size

- The effect size – it measures the intensity of the relationship between two sets of variables or groups. It is calculated by dividing the difference between the means of pertaining to groups by standard deviation
- The population standard deviation – it is the measure of the variation of dispersion of a set of values. A low standard deviation indicates that the value tend to be close to the mean of the set, while a higher standard deviation indicates that the population values are spread out over a wide range
- The desired power of the experiment to detect the postulated effect
- The significance level- Higher sample size allows the researcher to increase the significance level of findings since the confidence of the result are likely to increase with a higher sample size.
- Mainly involves the use of z-cals and t-cals

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How to determine sampling size

- Define the population size or number of people
- Designate your margin error
- Determine your confidence level
- Predict expected variance
- Finalise your sample size

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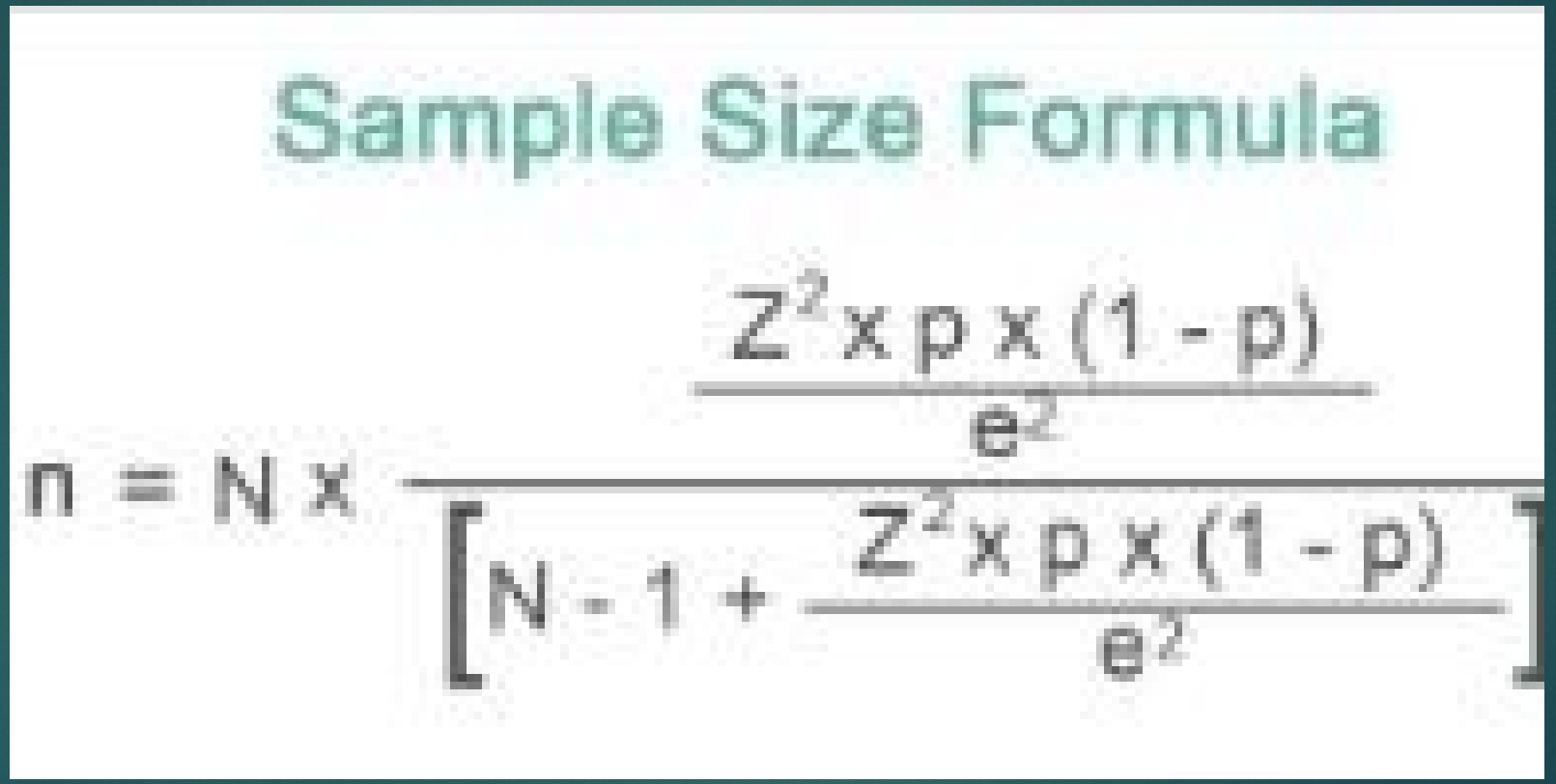
Sample size formula



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Defining the variables

- N = population size
- z = critical value of the normal distrubtion a required confidence level
- P = sample portion
- e = margin error
- As an example a retailer who is interested to know how many of their customers bought an item from them after viewing their website on certain day. Given that their website has an average of 10000 views per day determine the sample size of the customers that they have to monitor at a 90% confidence level with 5%margim error if :
- They are uncertain of the current conversion rate and they know fro the previous survey that rate is 5%

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working

- We are given N =10000
- Critical value =1.96 confidence level (z) =95%
- Margin error (e)=5% or 0,05

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Thank you

ANY QUESTIONS